DOCUMENT RESUME

ED 107 995 CE 004 264

AUTHOR Bryant, Eyris; And Others
TITLE An Analysis of the Data Processing Occupation.
INSTITUTION Ohio State Dept. of Education, Columbus. Div. of Vocational Education.; Ohio State Univ., Columbus. Trade and Industrial Education Instructional Materials Lab.
SPONS AGENCY Office of Education (DHEW), Washington, D.C.
PUB DATE [75]
NOTE 100p.; For related documents, see CE 004 160-206; CE 004 263, CE 004 265-268, and CE 004 425-427

EDRS PRICE MF-$0.76 HC-$4.43 PLUS POSTAGE
DESCRIPTORS Communication Skills; *Data Processing; *Data Processing Occupations; *Job Analysis; Knowledge Level; *Occupational Information; Safety; Skill Analysis; Skill Development; *Task Analysis; Task Performance; Work Attitudes

ABSTRACT

The general purpose of the occupational analysis is to provide workable, basic information dealing with the many and varied duties performed in the data processing occupation. The report has limited its discussion to entry level positions that are open to qualified high school graduates. The document opens with a brief introduction followed by a job description. The bulk of the document is presented in table form. Five duties are broken down into a number of tasks and for each task a two-page table is presented, showing on the first page: tools, equipment, materials, objects acted upon; performance knowledge (related also to decisions, cues and errors); safety--hazard; and on the second page: science; math--number systems; and communications (performance modes, examples, and skills and concepts). The duties listed are: preparing data entry information, operating computer, supervising programing, maintaining a systems library, and performing basic business applications for processing data. (BP)

**********
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
**********

CE004264

ED107995

Occupational Analysis

MAY 15 1975

# DATA ACCOUNTANT

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Instructional Materials Laboratory
Trade and Industrial Education
The Ohio State University

5265

# AN ANALYSIS OF THE DATA PROCESSING OCCUPATION

Developed By

Eyris Bryant
Instructor, Data Processing
Hughes High School
Cincinnati, Ohio

Jean A. Moldovan
Instructor, Data/Accounting
Lorain County J.V.S.
Oberlin, Ohio

Robert M. Simunic
Instructor, Data Processing
Choffin Career Center
Youngstown, Ohio

David Hargrove
Consultant
Bordan's Inc.
Columbus, Ohio

Occupational Analysis
E.P.D.A. Sub Project 73402
June 1, 1973 to December 30, 1974
Director: Tom L. Hindes
Coordinator: William L. Ashley

The Instructional Materials Laboratory
Trade and Industrial Education
The Ohio State University

"The activity which is the subject of this report was supported in whole or in part by the U.S. Office of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred."

TABLE OF CONTENTS


Foreword . . . . . v

Preface. . . . . vii

Acknowledgment . . . . . ix

Job Description . . . . . xi

Duties

A Preparing Data Entry Information . . . . . 1

B Operating Computer . . . . . 21

C Supervising Programming . . . . . 55

D Maintaining a Systems Library . . . . . 69

E Performing Basic Business Applications for Processing Data. . . . . 77

## FOREWORD

The occupational analysis project was conducted by The Instructional Materials Laboratory, Trade and Industrial Education, The Ohio State University in conjunction with the State Department of Education, Division of Vocational Education pursuant to a grant from the U.S. Office of Education.

The Occupational Analysis project was proposed and conducted to train vocational educators in the techniques of making a comprehensive occupational analysis. Instructors were selected from Agriculture, Business, Distributive, Home Economics and Trade and Industrial Education to gain experience in developing analysis documents for sixty-one different occupations. Representatives from Business, Industry, Medicine, and Education were involved with the vocational instructors in conducting the analysis process.

The project was conducted in three phases. Phase one involved the planning and development of the project strategies. The analysis process was based on scund principles of learning and behavior. Phase two was the identification, selection and orientation of all participants. The training and workshop sessions constituted the third phase. Two-week workshops were held during which teams of vocational instructors conducted an analysis of the occupations in which they had employment experience. The instructors were assisted by both occupational consultants and subject matter specialists.

The project resulted in producing one hundred two trained vocational instructors capable of conducting and assisting in a comprehensive analysis of various occupations. Occupational analysis data were generated for sixty-one occupations. The analysis included a statement of the various tasks performed in each occupation. For each task the following items were identified: tools and equipment; procedural knowledge; safety knowledge; concepts and skills of mathematics, science and communication needed for successful performance in the occupation. The analysis data provided a basis for generating instructional materials, course outlines, student performance objectives, criterion measures as well as identifying specific supporting skills and knowledge in the academic subject areas.

## PREFACE

Broadly defined, data processing encompasses people and many of their activities. Any individual today could refer to data processing as a major segment of "life." Processing data today has become an important function of the struggle to explore, invent, predict, analyze, organize and classify. To fulfill needs, men and women have introduced data processing into a multitude of different occupational areas. One has only to read the daily newspaper to recognize some of these areas: crime prevention, aerospace exploration, construction of highways, buildings, and entire cities. Within these broad areas the data processing student will find a wide range of specialized fields in which to concentrate.

Data processing is a rapidly changing field, and training institutions should keep up with the most recent technical developments in order to update equipment and methods of instruction. Schools can introduce the basic concepts and prepare students for entry level positions.

Presently in the data processing field there is a basic breakdown of three job levels. The first level would be filled by graduates of a vocational high school program. The second level would be made up of people with a two-year college background or five years work experience. The supervisory level would be the last level made up of people with a four-year college degree and two to five years experience, or ten years work experience and no college. In industry there is an overlapping between levels depending on the size of the data processing department.

In this report the writers have limited discussion to entry level positions of business data processing; those positions open to qualified high school graduates. Research found these positions to be unduly limited. Because some firms refuse to hire high school graduates in data processing it is believed there is a need to inform possible employers of the intensive training being offered and of the capabilities and potentialities of vocational graduates. Conversely, it is also believed that more high school students should be made aware of the highly favorable job market in business data processing and of their school's innovative training facilities available for their use.



7

ACKNOWLEDGMENT

We wish to acknowledge the valuable assistance rendered by the following subject matter specialists. They provided input to the vocational instructors in identifying related skills and concepts of each respective subject matter area and served as training assistants in the analysis process during the two-week workshops.

Rollin M. Barber, Psychology
The Ohio State University
Columbus, Ohio

Jodi Beittel, Communications
Columbus, Ohio

Diana L. Buckeye, Mathematics
University of Michigan
Avon Lake, Ohio

Rick Fien, Chemistry
The Ohio State University
Beachwood, Ohio

N.S. Gidwani, Chemistry
Columbus Technical Institute
Columbus, Ohio

Bruce A. Hull, Biology
The Ohio State University
Columbus, Ohio

Donald L. Hyatt, Physics
Worthington High School
Worthington, Ohio

Glenn Mann, Communications
Columbus, Ohio

Jerry McDonald, Physical Sciences
Columbus Technical Institute
Reynoldsburg, Ohio

Colleen Osinski, Psychology
Columbus Technical Institute
Columbus, Ohio

David Porteous, Communications
University of Connecticut
Colchester, Connecticut

James A. Sherlock, Communications
Columbus Technical Institute
Columbus, Ohio

Jim VanArsdall, Mathematics
Worthington High School
Worthington, Ohio

Lillian Yontz, Biology
The Ohio State University
Caldwell, Ohio

Acknowledgment is extended to the following I.M.L. staff members for their role in conducting the workshops; editing, revising, proofing and typing the analyses.

| | |
|---|---|
| Faith Justice | Research Associate |
| Sheila Nelson | Administrative Assistant |
| Marsha Opritza | Editorial Consultant |
| Rita Buccilla | Typist |
| Peg Bushelman | Typist |
| Carol Fausnaugh | Typist |
| Mindy Fausnaugh | Typist |
| Rita Hastings | Typist |
| Carol Hicks | Typist |
| Sue Holsinger | Typist |
| Barbara Hughes | Typist |
| Carol Marvin | Typist |
| Patti Nye | Typist |
| Kathy Roediger | Typist |
| Mary Salay | Typist |

## JOB DESCRIPTION

The jobs available in data processing are numerous and involve varying degrees of education and training. The console operator operates a computer system (including entry of variable data through the console keyboard, initialization and loading of programs), monitors the program during execution and records equipment utilization figures.

The systems data librarian is a person responsible for all of a system's records, files, discs, and tapes. That person organizes and categorizes for speedy reference, and is responsible for strict security of library data. He/she also maintains a schedule for users of data, establishes priorities for its use, and coordinates users reservations and requests. Maintaining a current library record file of computer log time, and making frequent evaluations and recommendations to managers and supervisor concludes his/her duties.

The junior systems manager, under direct supervision, assists higher level classifications in devising computer system specifications and records layouts. This person is usually fairly competent to work on several phases of systems analysis with only general directions, but still needs some instruction and guidance for the other phases.

A supervisor of computer operations controls the operation of the computer and peripheral data processing equipment. He/she is considered as being in charge of all activities of computer operations. Tasks in this job also include establishing detailed schedules for the utilization of the computer to obtain maximum usage and the best results, assigning personnel to the various operations and instructing them when necessary, and reviewing equipment logs and reports to the manager of data processing on the equipment operations efficiency.

The senior computer operator, under general supervision of the manager of computer operations, monitors and controls the computer by operating the central console. This person is usually competent to work at a high level of all computer operation phases. He/she also studies program operating instruction sheets to determine equipment set-up and run operation and confers with technical personnel in the event errors require change in instruction or sequence of operations.

The junior programmer usually is fairly competent to work on several phases of programming with only general direction but still needs some instruction and guidance for the other phases. He/she codes program instructions, assists in preparing test data, testing, and debugging programs.

A junior computer operator assists higher level classifications in monitoring and controlling the computer. This person is usually fairly competent to work on several phases of computer operations but still needs some instruction and guidance for the other phases.

The manager of unit record equipment, under supervision of a data processing manager, directs the personnel of the unit record department and manages the preparation of various reports and data. In non-computer installations he/she may be considered manager of data processing with similar responsibility.

A keypunch supervisor, under supervision of the data processing or unit record manager, plans, schedules, supervises, and directs key punching and verifying activities. Also this person maintains the corresponding files, supervises assigned personnel to carry out the above activities, and trains new employees.

A junior keypunch/tape operator, under direct supervision, operates keypunch, tape, and verifier machines, works on procedures used to perform routine assignments; performs related clerical duties.

The communications equipment operator is responsible for the operation of data transmission devices.

Duty A Preparing Data Entry Information

1 Operate keypunch
2 Operate sorter
3 Operate verifier
4 Operate reproducer
5 Operate interpreter
6 Operate collator
7 Operate calculator
8 Operate accounting machine
9 Operate input/output unit for punched paper tape

(TASK STATEMENT) OPERATE KEYPUNCH

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Keypunch [with or without printer]<br>Blank cards, correct size and color for particular assignment<br>Card saw-clear jams [prying knife]<br>Connection tape<br>New ribbon in case during the day or work assignment the ribbon needs changing<br>Layout sheets<br>Sand paper file<br>Machine reference manual<br>IBM<br>Keypunch 024, 026, 029, 129 or Univac equipment | Load cards; check accuracy of punches with card gauge<br>Analyze data to be keypunched and set beside machine<br>Read card layout<br>Make a program card or put program into machine<br>Test program card or program<br>Check space allocation [card design for data given]<br>Determine special codes to be used<br>Determine special instructions from programmer<br>Keypunch; make corrections; make new cards<br>Duplicate damaged cards<br>File and remove cards from master file<br>Receive proofread printouts and correct errors<br>Route work to next station-verify<br>Clean machines | Pin back long hair to keep it out of machine<br>Unplug machine before any simple maintenance such as replacing starwheel<br>All chips in the chip box must be carefully disposed into trash containers; if used as confetti they can cut a person's eye<br>Electrical shock-frequent inspection of cord plugs that may be damaged<br>Card edges may cut fingers by improper handling |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine use of program card/ alternate programming/memory<br><br>Determine the correct position for all automotive levers | Automatic shipping and duplicating not being performed | Programmed card not fasten correctly to drum<br>Source data and cards out of order<br>Damage cards form moisture or folds<br>Lift starwheels before removing drum damages printing unit<br>Do not duplicate multiple program punches on printing keypunch, this can damage printer<br>Only use felt pen when writing on card-a pen or pencil indentation could damage card |

(TASK STATEMENT) OPERATE KEYPUNCH

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Apply workings of phytocells and photodiode to computers<br>Apply the basic electrical current to completing a circuit<br>Simple machines used to gain mechanical advantage [card saw as simple lever]; work input/output, friction and efficiency in simple machines [friction on card transport mechanism]<br>Resistance of materials to change in shape [excessive force damages transport mechanism; avoid excessive sanding of card transport wheels; relationship of force to distortion in an elastic body [excessive force can shear or bend cards]<br>Professionalism: Maintain capacity to foster cooperation, to function efficiently when encountering fast changing, multiple, personal or situation variables; exhibit qualities of self-confidence, self-control, self-respect, self-reliance and adaptability<br>Attributes of maximum functioning capacity: Conscious awareness of the need for a balance between tension and relaxation; conscious awareness of physical expressions basic to peak physical performance; conscious awareness of qualities basic to optimal mental performance | Use binary numbers on reading card for 80, 96, 120 column card<br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with the decimal numeral system (binary, octal, etc.)<br>Positive rationals<br>Use of numbers (without calculation)<br>Counting<br>Coding [Hollerith's code, basic math symbol]<br>Ratio<br>Fundamental operations (calculation)<br>Addition, subtraction, multiplication and division algorithms; order of operations, i.e., use of parentheses in simplifying arithmetic expressions |

## COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, program languages | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes, emblems |

(TASK STATEMENT) OPERATE SORTER

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Sorter [IBM and photo cells]<br><br>Extra brushes<br><br>Check cards [cards with 8's punched to check timing]<br><br>Reference manual<br><br>Screwdriver [use to replace brushes] | Check timing - replace brush if required and are 8 punch card<br><br>Load cards<br><br>Determine what is to be sorted<br><br>Sort numerically<br><br>Sort alphabetically<br><br>Use selection switch<br><br>Route to next station | SAFETY:<br>Do not clear card jams unless machine is unplugged<br><br>Do not change brushes unless machine is unplugged<br><br>Check for broken and damaged cards or damaged plugs<br><br>HAZARD:<br>Electrical shock<br><br>Fingers can be pinched in moving parts around brushes |
| **DECISIONS** | **CUES** | **ERRORS** |
| **Determine where to start alphabetizing**<br><br>Determine if sorting switch(es) turned to proper location for type of sorting to be performed | All cards fall into reject pocket | Take cards out of pockets in wrong order<br><br>Damaged cards will jam |

15

(TASK STATEMENT) OPERATE SORTER

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Apply basic concept of a completed electrical circuit by having brushes touch copper<br>Operation of photo-electrical cells<br>Simple machines used to gain mechanical advantage [use of simple hand tools]<br>Resistance of materials to flow of electrical current [electrical contacts exposed to view in some instances]<br>Resistance of materials to change in shape [metal brushes bend easily]<br>BEHAVIORAL SCIENCE:<br>Professionalism: Maintain capacity to foster cooperation; to function efficiently when encountering fast changing, multiple, personal or situational varibles<br><br>Attributes of maximum functioning capacity | Count and placement of decimals<br>Locate by approximation rational numbers and integers on the number line (sequential ordering)<br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Positive rationals<br>Use of numbers (without calculation)<br>Counting<br>Indexing<br>Coding<br>Fundamental Operations (Calculation)<br>Addition, Subtraction, Multiplication and Division algorithms<br>Order of operations, i.e., use of parentheses in simplifying arithmetic expressions[Hollerith code] |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Program languages | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes emblems, Ordering |

(TASK STATEMENT) OPERATE VERIFIER

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Verifier<br>Correction tape<br>Card saw or knife for cleaning jams<br>Ribbon<br>Sand paper file<br>Machine reference manual<br>Card layout sheets | Check accuracy of punching with card gauge<br>Put cards in machine<br>Source data in order that corresponds to cards<br>Analyze program card<br>Determine card layout<br>Check special codes<br>Punch cards through<br>Remove cards to be corrected<br>Correct cards<br>Replace corrected card in correct sequence<br>Check for verification notch in all cards<br>Route data to next station | SAFETY:<br>Keep long hair out of machine<br>Lift star wheels before removing drum<br>Check line cards and plugs for damage<br><br>HAZARD:<br>Electrical shock |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Select corresponding program card<br>Determine if automatic levers are in proper location | Automatic duplicating and shipping not being performed | Damaged cards, Keep cards in order |

(TASK STATEMENT) OPERATE VERIFIER

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Apply point of law on circuit conduction<br>Simple machines used to gain mechanical advantage [card saw is simple lever]<br>Work input, work output, friction and efficiency in simple machines [friction on card transport mechanism]<br>Relationship of force to distortion in an elastic body [excessive force shear or bend cards]<br>Resistance of materials to change in shape [excessive force can damage transport mechanisms]<br>**Professionalism: Maintain capacity to foster cooperation; to function efficiently when encountering fast changing multiple, personal or situational variables; exhibit qualities of self-confidence, self-control, self-reliance, self-respect, and adaptability**<br>Attributes of maximum functioning capacity | Count and placement of decimals<br>Locate by approximation rational numbers and integers on the number line (sequential ordering)<br>Hindu-Arbic Numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare & contrast various base number systems with our decimal numeral system<br>Use of numbers (without calculation)<br>Counting<br>Coding [Hollerith's code, Basic math symbols]<br>Ratio<br>Positive rationals<br>Fundamental Operations (calculation)<br>Addition, Subtraction, Multiplication, and Division algorithm<br>Order of operations |

**COMMUNICATIONS**

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Program languages, Programmer cards | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes, emblems |

(TASK STATEMENT) OPERATE REPRODUCER

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Reproducer<br>Cards<br>Ribbon (for replacement if worn]<br>Card file-clear jam<br>Control panels<br>Wires<br>Reference manual | Check machine for good operation<br>Wire control panel<br>Reproduce (duplicate) cards<br>Gang punch cards<br>Convert from mark sense to cards<br>Sense and punch mark sense cards<br>Observe machine for malfunctioning | SAFETY:<br>Check line cords and plugs for damage<br>Unplug machine before clearing card jams<br><br>HAZARD:<br>Electrical shock |
| **DECISIONS** | **CUES** | **ERRORS** |
| Determine if proper switches are in "on" or "off" position | Cards move into hopper pockets but no punches are made in cards | Punch alignment off<br>Damaged cards cause jams<br>Error in control panel<br>Damaged wires |

(TASK STATEMENT) OPERATE REPRODUCER

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Resistance of materials to flow of electrical current [understand electrical flow characteristics for wiring patchboards]<br>Simple machines used to gain mechanical advantage [card saw is simple lever]<br>Relationship of force to distortion in an elastic body [wires may be damaged by tensile pull - use plug to disconnect]<br>Resistance of materials to change in shape [excessive force can damage transport mechanisms]<br>Professionalism: Maintain capacity to foster cooperation and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br>Attributes of maximum functioning capacity | Count and placement of decimals<br>Locate by approximation rational numbers and integers on the number line (sequential ordering)<br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Positive pationals<br>Use of numbers (without calculation)<br>Counting<br>Indexing<br>Coding<br>Fundamental operations (calculation)<br>Addition, Subtraction, Multiplication, and Division algorithms |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Program languages, control panel diagrams | Comprehension, Detail, Informational Reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes, emblems |

(TASK STATEMENT) OPERATE INTERPRETER

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Interpreter<br>Cards<br>Ribbon (replace if worn)<br>Card saw to clear jams<br>Machine reference manual | Place source cards in hopper<br>Print desired data<br>Remove cards<br>Route to next job | SAFETY:<br>Check line cords and plugs for damage<br>Unplug machine before clearing card jams<br>HAZARD:<br>Electrical shock |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Ascertain number of source cards<br>Determine if switches are in proper location | Printing is not visible | Card jam (card could be damaged and have to be replaced)<br>Be careful to keep cards in order |

**(TASK STATEMENT)** OPERATE INTERPRETER

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Resistance of materials to flow of electrical current [understanding of electrical flow of characteristics for wiring patchboards]<br>Simple machines used to gain mechanical advantage [card saw is a simple lever]<br>Relationship of force to distortion in an elastic body [excessive force can shear or bend cards]<br>Resistance of materials to change in shape [excessive force can damage transport mechanisms]<br>Professionalism: Maintain capacity to foster cooperation, to function efficiently when encountering fast changing, multiple, personal or situational varibles; Exhibit qualities of self-confidence, self-control, self-respect<br>Attributes of maximum functioning capacity<br>Conscious awareness of physical expressions basic to peak physical performance, and of qualities basic to optimal mental performance | Count and placement of decimals<br>Locate by approximation rational numbers and integers on the number line (sequential ordering)<br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Positive rationals<br>Use of numbers (without calculation)<br>Counting<br>Indexing<br>Coding<br>Fundamental operations (calculation)<br>Addition, Subtraction, Multiplication, Division algorithms<br>Order of operations, i.e., use of parentheses in simplifying arithmetic expressions [Hollerith code] |

**COMMUNICATIONS**

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Program languages | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes, emblems |

(TASK STATEMENT) OPERATE COLLATOR

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Wire boards<br><br>Templates (paper wiring overlay)<br><br>Wires - different sizes [lengths, color]<br><br>Diagrams wiring [form- board design]<br><br>Cards [replace damaged]<br><br>Sample cards [test deck]<br><br>Machine reference manual | Determine what is to be collated and the desired result<br><br>Test board with sample cards<br><br>Load cards<br><br>Run<br><br>Route to next station | SAFETY:<br><br>Be careful not to catch fingers when closing latches after clearing a card jam in primary and secondary feeds<br><br>Check line cords and plugs for damage<br><br>Unplug machine before clearing card jams<br><br>HAZARD:<br><br>Electrical shock |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine procedure to use [merge, match, select sequence]<br><br>Determine if levers are in proper locations | No merging or matching being performed | Put cards in wrong feeds<br><br>Board wired wrong<br><br>Damaged wires<br><br>Damaged card - causes jam |

(TASK STATEMENT) OPERATE COLLATOR

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Resistance of materials to flow of electrical current<br>[understand electrical flow characteristics for wiring patchboards]<br><br>BEHAVIORAL SCIENCE<br>Professionalism: Maintain capacity to foster cooperation and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Positive rationals<br>Locate by approximation rational numbers and integers on the number line (sequential ordering)<br>Count and placement of decimals<br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Use of numbers (without calculation)<br>Counting<br>Indexing<br>Coding<br>Fundamental Operations (calculation)<br>Addition, Subtraction, Multiplication and Division algorithms<br>Order of operations (Hollerith's code) |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Program languages | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals, Interpret wire diagrams | Visual analysis, Memory, Recognition of symbols, codes, emblems, |

(TASK STATEMENT) OPERATE CALCULATOR

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Calculator (IBM 604)<br>Reference manual<br>Cards<br>Control panel<br>Wires | Receive cards<br>Prepare control panel<br>Punch needed quantities on cards<br>Load cards<br>Machine reads and calculates simple arithmetic operation<br>Remove cards | SAFETY:<br>Check line cords and plugs for damage<br>HAZARD:<br>Electrical shock |
| **DECISIONS** | **CUES** | **ERRORS** |
| Check wiring for proper contact<br>Determine if switches or levers are in proper location | No punching being performed | Error in punching cards<br>Feed cards in incorrect order |

(TASK STATEMENT) OPERATE CALCULATOR

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Resistance of materials to flow of electrical current [understand electrical flow characteristics for wiring patchboards]<br><br>BEHAVIORAL SCIENCE:<br><br>Maintain capacity to foster cooperation, and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Positive Rationals<br>Addition and subtraction of decimal fractions<br>Multiplication and division of decimal fractions<br>Hindu-Arabic numeral system<br>Number/numeral, Place value/expanded notation, Compare and contrast various base number systems with our decimal numeral system<br>Use of numbers (without calculation)<br>Counting, Indexing, Coding<br>Fundamental operations (calculations)<br>Addition, Subtraction, Multiplication and Division algorithms<br>Order of operations<br>Basic Arithmetic skills and concepts<br>Reduction of fractions, Changing mixed numbers to improper fractions, Changing % to fractions and fractions to %, Finding a % of a number and what % one number is of another, Changing fractions to decimal and vice versa |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Program languages, Interpret wire diagrams | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes and emblems |

(TASK STATEMENT) OPERATE ACCOUNTING MACHINE

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Paper for printer<br>Control wire boards<br>Wires (color coded sizes)<br>Cards<br>Reference manual<br>Forms for drawing wire diagrams | Wire boards to produce desired report form as determined by supervisor<br>Load cards<br>Align paper<br>Machine accumulates totals and prints<br>Remove printed form and route<br>Remove cards and file or route | SAFETY:<br>Check line cords and plugs for damage<br>Unplug before cleaning paper jams<br>HAZARD:<br>Electrical shock |
| **DECISIONS** | **CUES** | **ERRORS** |
| Check wiring for proper contact<br>Dial levers to proper position | No printing being performed | Faulty wires<br>Incorrect calculation |

(TASK STATEMENT) OPERATE ACCOUNTING MACHINE

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Resistance of materials to flow of electrical current [understand electrical flow characteristics for wiring patchboards]<br>Professionalism: Maintain capacity to foster cooperation, and to function efficiently when encountering fast changing, multiple, personal or situational varibles; exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability<br>Attributes of maximum functioning capacity<br>Conscious awareness of physical expressions basic to peak performance: Body rhythm, Breathing coordinated with body movement, Body balance and posture, Movement from tension to relaxation and vice versa<br>Conscious awareness of qualities basic to optimal mental performance: Attention, Observation, Concentration, Mental alertness,Quietude and Clarity, Organization | Basic math principles<br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Positive rationals<br>Use of numbers (without calculation)<br>Counting, Ordering, Indexing, Ratio<br>Fundamental operations (calculation)<br>Addition, Subtraction, Multiplication and Division algorithms<br>Basic arithmetic shills and concepts<br>Reduction of fractions, Changing mixed numbers to improper fractions, Changing percents to fractions and fractions to percents, Finding a percent of a number and what percent one number is of another, Changing fractions to decimal and decimals to fractions |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Program languages | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes, and emblems |

(TASK STATEMENT) OPERATE INPUT/OUTPUT UNIT FOR PUNCHED PAPER TAPE

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| IBM<br>Card-to-tape [change cards to tape]<br>Tape-to-card [change tape to cards]<br>Teletype (TTY) terminals<br>Paper tape readers [IBM 1017]<br>Paper tape punch [IBM 1018]<br><br>Paper tape [8 channel, 5 channel]<br><br>Cards [blanks]<br><br>Reference manuals<br><br>Label [label new tapes and decks] | Load media- aligns<br><br>Transfer data<br><br>Verify for obvious mistakes by examining tape manually<br><br>Label new media<br><br>File media or route to next station | SAFETY:<br><br>Keep fingers away from moving mechanical parts<br>Keep fingers out of paper punch mechanism<br><br>HAZARD:<br><br>Cut fingers |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine if paper tape is the best method to be used | Data not transferred | Hole misalignment<br><br>Tearing of tape<br><br>Tape not cleanly punched [punches still partially attached to paper tape] |

(TASK STATEMENT) OPERATE INPUT/OUTPUT UNIT FOR PUNCHED PAPER TAPE

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Optical readers<br>Wire brush pens<br>Pen sensing<br>Professionalism: Maintain capacity to foster cooperation and to function efficiently when encountering fast changing, multiple,personal or situational varibles; exhibit qualities of self-confidence, self-control, self-reliance self-respect and adaptability<br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation. Relates to: Comfort, Caution, Safety, Physical, Emotional and Intellectual health<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Measure with the metric and English system and convert between them [binary numbers]<br>Sequential ordering<br>Count and placement of decimals<br>Hindu-Arabic numeral system<br>Numeral/number, Place value/expanded notation, Compare and contrast various base number systems with our decimal numeral system<br>Use of numbers (without calculation)<br>Counting, Indexing, Coding<br>Fundamental operations (calculation)<br>Addition, Subtraction, Multiplication, Division algorithms<br>Order of operations [Hollerith code, Basic math symbol]<br>Positive rationals |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Program languages | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes, and emblems |

Duty B Operating Computer

1 Operate console
2 Load programs and data cards
3 Maintain equipment
4 Prepare back-up data for storage
5 Supervise storage of back-up data
6 Operate magnetic tape units
7 Maintain cards files
8 Initiate emergency test procedure
9 Operate card reader
10 Operate card punch
11 Operate line printer
12 Operate optical I/O devices
13 Load and operate disk drives or cartridges
14 Operate teletypewriter terminals
15 Operate on line systems
16 Update manuals

(TASK STATEMENT) OPERATE CONSOLE

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Software console operation manuals<br>Technical notes or flashes<br>General flow charts<br>System flow charts<br>Run manual<br>Console printer paper<br>Console printer ribbon<br>Pens, pencils, run sheets | Card to printer operations<br>Maintain technical files on equipment operation and procedural changes- update manuals<br>Follow systems flow charts to set up program to be run<br>Read control keys & buttons<br>Monitor program through display or electric pencil<br>Turn on peripheral devices as indicated in run manual or flow chart<br>Add information from keyboard as needed<br>Record operating time<br>Supervise time schedule of what is to be run<br>Monitor peripheral devices<br>Interpret warning conditions and correct<br>Up-date run manuals<br>Monitor on line systems, accept and process data, and send out data | Keep fingers away from console area that houses printing keys- fixing console printout paper while terminal may begin printing may cut fingers<br>Improper paper handling may cut fingers<br>No smoking in computer rooms- damage to storage media and equipment<br>Room should be kept air-conditioned and humidity controlled as CPU will not work with accuracy when too warm<br>Hands should be kept away form all moving parts<br>No liquids permitted in computer room, spilling liquids into equipment will cause severe damage<br><br>CPU- Central Processing Unit |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine whether to correct mechanical malfunctions by self or call for specialist<br>Determine what to run first | Warning lights<br>Interpretation of messages<br>Interpretation of mnemonics | Overheating of equipment<br><br>Misinterpretation of instructions |

(TASK STATEMENT) OPERATING CONSOLE

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Resistance of materials to flow of electrical current [understand electrical flow characteristics, fuse failure, etc.]<br>Magnetic fields of force [avoid use of magnetics or foils adjacent to hard and soft ware<br><br>BEHAVIORAL SCIENCE:<br>Maintain capacity to foster cooperation and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br><br>Attributes of maximum functioning capacity | Compare; contrast various constructed base systems with decimal numerals<br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Use of numbers (without calculation)<br>Counting<br>Ordering<br>Indexing<br>Coding<br>Positive rationals |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Writing | Record data about run | |
| Speaking | Explain to programmer or supervisor what problems had in running program | |
| Reading | Read codes or parity errors, Interpreting operational manuals, Program languages | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes, emblems |

(TASK STATEMENT) LOAD PROGRAMS AND DATA CARDS

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Pencils<br><br>Tapes<br><br>Master systems disk [superviser disk]<br><br>User disk<br><br>Cards | Take medium with supervisor and load [supervisor can be on cards, disc, or tape]<br>Change symbolic language to machine language - compilation<br>Store source medium<br>Use run manual to determine operation<br>Use compilation - object to process data<br>Store and label medium that now contains object and source data<br>Take reports and route to next station<br>Record time of job | Data card handling - fan, flex and joggle deck before loading<br>Loading damaged cards into card reader will cause card jams<br>Warped cards must be repunched on keypunch<br>No smoking allowed in computer rooms - ashes will damage storage media<br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br>Hands should be kept away from all moving parts<br>Liquids (coffee, pop, etc.) should be in the computer room - spilling liquids into equipment will cause severe damage |
| **DECISIONS** | **CUES** | **ERRORS** |
| Determine time schedule for partition | Incorrect control cards | Mechanical breakdown |

(TASK STATEMENT) LOAD PROGRAMS AND DATA CARDS

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE<br><br>Maintain capacity to foster cooperation, and to function efficiently when encountering fast changing, multiple, personal or situational varible<br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation. Relates to: comfort, caution, safety, and physical, emotional, and intellectual health<br>Conscious awareness of physical expressions basic to peak physical performance: body rhythm, breathing coordinated with body movement; body balance and posture, movement from tension to relaxation and vice versa<br>Conscious awareness of qualities basic to optimal mental performance: attention, observation, concentration, mental alertness, mental quietude, mental clarity, organization | Compare; contrast various constructed base systems with decimal numerals (binary numbers)<br>Hindu-Arabic numeral system: Number/numeral, place value/ expanded notation, compare and contrast various base number systems with our decimal numeral system<br>Use of numbers (without calculation): counting, coordinate system, ordering, indexing, coding, ratio, measurement, recording; addition, subtraction, multiplication and division algorithms; order of operaitons, i.e., use of parentheses in simplifying arithmetic expressions<br>Read and interpret tables, charts and graphs [logs]<br>Reduction of fractions; changing mixed numbers to improper fractions; changing percents to fractions and fractions to percents; finding a percent of a number and what percent one number is of another; changing fractions to decimal and decimals to fractions;<br>Ratio and proportion; estimation |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Program languages, Software manuals | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes, emblems |
| Writing | Record data in run manual | |

(TASK STATEMENT) **MAINTAIN EQUIPMENT**

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Hardware - computer and peripheral devices<br>Paper, forms<br>Clock tapes<br>Vertical format tapes<br>Lamps [photocells]<br>Ribbon for printer<br>Ribbon for card punch<br>Brush<br>Lint free cloth<br>Non-abrasive cleaning fluid or solvent<br>Test decks<br>Wood sticks<br>Vacuum sweeper | Select correct form or paper for job - align<br>Keep track of life of printer ribbon and change when needed<br>Coordinate spacing of document on paper as instructed in run manual or from program (vertical format tape)<br>Keep reader clean and dust free and change lamp when required [change clock tape some models]<br>Clean tapes<br>Clean disks<br>Change ribbon on card punch as needed<br>Clear card punch of dust and punches<br>Clean outer covering of hardware<br>Run test disks to check out system<br>Change ribbon on computer console as needed<br>Check printer hammers and chain on line printer, change print ribbon<br>Vacuum dust and dirt in printer | SAFETY:<br>Keep long hair pinned back and out of machine<br>Bend knees when lifting boxes of paper and cards<br>Dusting internal parts of peripheral equipment can cut fingers<br><br>HAZARD:<br>Sharp metal edges<br><br>No smoking in computer room - damage to storage media and equipment<br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracu<br>Hands should be kept away from all moving parts<br>No liquids permitted in the computer room - severe damage if spilled |
| **DECISIONS** | **CUES** | **ERRORS** |
| Determine the correct route for ribbons when replacing them | Ribbon does not wind to opposite spool | Do not stretch ribbon in paper jam<br><br>Head crash |

36

(TASK STATEMENT) MAINTAIN EQUIPMENT

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Simple machines used to gain mechanical advantage [wood stick is simple tool; vacuum cleaning machine usage ]<br>Resistance of materials to flow of electrical current [may be exposed to electrical shock - must be aware of electrical flow characteristics]<br>Resistance of materials to change in shape [ribbon will stretch]<br><br>BEHAVIORAL SCIENCE:<br>Maintain capacity to foster cooperation, and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br><br>Attributes of maximum functioning capacity | Measurement: non-geometric<br>time |

37

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Technical notes in hardware | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of codes, symbols, emblems |

(TASK STATEMENT) PREPARE BACK-UP DATA FOR STORAGE

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Tapes<br>Cards<br>Disk<br>Labels<br>Original data<br>Files<br>Microfilm<br>Run manuals<br>Software operation revision releases | Follow run manual instructions for each program<br>Duplicate data to be stored on pre-determined medium<br>Label back-up<br>Store back up in house or prepare for shipping<br>Refile original data<br>Inspect disks for any physical damage | When storing back-up data i.e., disk cartridges, card decks, etc, that are packed in boxes, use correct lifting principles - back injury<br>No smoking in computer room - damage to storage media and equipment<br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br>Hands should be kept away from all moving parts<br>No liquids should be permitted in the computer room - will cause severe damage if spilled |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine priorities and proper sequence | Lowest priority duplicated first | Cards damaged from moisture<br>Deadline not met |

(TASK STATEMENT) **PREPARE BACK-UP DATA FOR STORAGE**

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Magnetic fields of force<br>Transfer of energy from one form to another<br>BEHAVIORAL SCIENCE:<br>Inhibitors of efficient job performance (fear, anxiety, rigidity, inflexibility and tension) resulting from:<br>Excessive anticipation of expected events<br>Excessive attachment of fixed-projected time sets e.g. schedules, appointments, deadlines, etc.<br>Conditions for healthy and growth-directed job performance<br>Capacity to perceive, quickly integrate, and function well in the face of unexpected situational varibles<br>Professionalism:<br>Maintain capacity to faster cooperation, and to function efficiently when encountering fast changing, multiple, personal, or situational varibles<br>Attributes of maximum functioning capacity | Hindu–Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Positive rationals<br>Use of numbers (without calculation)<br>Counting, Coordinate system, Ordering, Indexing, Coding, Ratio, Measurement, Recording<br>Fundamental Operations (Calculation)<br>Addition, Subtraction, Multiplication, and Division algorithms<br>Order of operations<br>Basic Arithmetic skills and concepts<br>Reduction of fractions, Changing mixed numbers to improper fractions, Changing % to fractions and fractions to %, Finding a % of a number and what % one number is of another<br>Changing fractions to decimal and vice versa. Ratio and proportion, Estimation |

**COMMUNICATIONS**

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpret manuals, Instructions and charts | Comprehension, Terminology, Definition Description of mechanism, Recommendation reports, Detail |
| Writing | Labeling back-up materials | Spelling, Penmanship, Logic, Description, Classification |

(TASK STATEMENT) SUPERVISE STORAGE OF BACK-UP DATA

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Tapes<br>Cards<br>Disk packs<br>Labels<br>Original data<br>Files<br>Microfilm<br>Run manuals | Interpret laws affecting storage<br>Decide how long materials should be stored<br>Decide what medium should be used to store data<br>Decide where data should be stored<br>Decide when to update material or backup | Do not lift heavy equipment or boxes - back injuries<br>Metal file cabinets may have sharp edges-severe cuts, fingers, hands<br>No smoking in computer room - damage to storage media and equipment<br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br>Hands should be kept away from all moving parts<br>No liquids should be permitted in the computer room - will cause severe damage if spilled |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine priorities<br>Determine sequence | Unfilled requests | Fires, arson, theft |

(TASK STATEMENT) SUPERVISE STORAGE OF BACK-UP DATA

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Effect of heating and cooling on expansion of materials<br>Magnetic fields of force<br><br>BEHAVIORAL SCIENCE:<br>Supervision:<br>Distribute personnel with regard to leadership qualities and experiences for optimum team performance<br>Maintain customer illusion of privacy by avoiding excessive noise or movement<br>Grant apprpriate regard for customer's personal space<br>Grant conscious attention to smoothly flowing team work<br>Maintain regard for differing views on maximum efficiency of the operations<br>Grant appropriate regard for customer's unique needs<br>Exhibit capacity to acertain best service for the particular party type requested<br>Show and describe facilities with appropriate speed and clarity<br>Communicate pride in esrablishment | Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Positive rationals<br>Use of numbers (without calculation)<br>Counting, Coordinate system, Ordering, Indexing, Coding, Ratio, Measurement, Recording<br>Fundamental Operations ( calculation)<br>Addition, Subtraction, Multiplication and Division algorithms<br>Order of operations<br>Reduction of fractions, Changing mixed numbers to improper fractions, Changing % to fractions and fractions to %, Ratio and Proportion, Estimation, Finding a % of a no. and what % one no. is of another, Changing fractions to decimal & vice versa, Guess and check method, Rule of Thumb |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Viewing | Storage of back-up data | Visual analysis, Memory, Description Logic, Color discrimination, Recognition of symbols, codes, emblems |
| Listening | Storage of back-up data | Auditory Discrimination, Recognize opinions |

(TASK STATEMENT) OPERATE MAGNETIC TAPE UNITS

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Felt pens, pencils, pens<br><br>Splices, splicer tape<br><br>Tapes<br><br>Label [adhesive sticker that can be removed without leaving a residue] | Receive request for tape [from computer operator or data eng. supervisor]<br>Pull tape; file protectioning should be removed carefully; send to console operator; open hub latch and place tape on reel<br>Press reel back until it is against stop and hub latch is closed<br>Unwind 3-4 feet and thread mechanisms onto take-up wheel<br>Hook tape on take-up reel and turn clockwise until tape is wrapped around itself. Wire tape is wound in the take-up reel until the load-point marker is several turns past the read/write heads<br>Receive tape, refile; receive new tape label; assign code for file [log]<br>Record record of tape in control tape manual [record of all tapes]<br>Repair tape; send back-up to new area [other plants branches] | Each tape should be kept in a dust-free container when not in use. It should be stored in a cabinet elevated from the floor and away from paper and cards which produce dust<br>Do not expose to heat<br>Never use an eraser to alter ID label [erasures can jam machine]<br>Avoid pinching reel or contacting exposed edge of the tape-handle near hub<br>Never touch tape except in the leader area when threading<br>Do not touch tape drive heads except for cleaning and maintenance<br>Never power down machine with tape head down-may erase<br>Smoking should not be permitted in machine room, ashes contaminate tape |
| **DECISIONS** | **CUES** | **ERRORS** |
| Determine when to duplicate worn tape | Unfilled request | Broken tapes<br>Improper winding |

(TASK STATEMENT) OPERATE MAGNETIC TAPE UNITS

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Magnetic fields of force [recognize damaging effect of magnetic field on record storages devices]<br>Simple machines used to gain mechanical advantage [splicer is a simple machine with clamps]<br>Transfer of heat from one body to another [heat damages storage device]<br>BEHAVIORAL SCIENCE:<br>Inhibitors of efficient job performance resulting from:<br>Excessive anticipation of expected events<br>Excessive attachment to fixed-projected time sets<br>Conditions for healthy and growth-directed job performance<br>Capacity to percieve, quickly integrate, and function well in the face of unexpected situational varibles<br>Professionalism:<br>Maintain capacity to foster cooperation, and to function efficiently when encountering fast changing, multiple personal or situational varibles<br>Attributes of maximum functioning capacity | Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Use of numbers (without calculation)<br>Counting<br>Ordering<br>Indexing<br>Coding<br>Ratio<br>Fundamental Operation (calculation)<br>Addition, Subtraction, Multiplication, and Division algorithms<br>Order of operations, i.e. use of parentheses in simplifying arithmetic expressions |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Writing | Record area of storage in manual | Classification, Logic, Penmanship |

43

(TASK STATEMENT) MAINTAIN CARDS FILES

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Felt pen to label cards<br><br>Control decks<br><br>Rubber bands - temporarily keep cards together<br><br>Blank cards<br><br>Machine language decks for compilation<br><br>Discette to cards, to tape<br><br>Keypunch machine<br><br>Card filing cabinets | File cards and select from files<br>Select correct cards for procedure<br>Duplicate damaged cards on keypunch<br>Label new decks<br>Destroy cards that are out-of-date<br>Prepare control decks [directed by analyst]<br>Compile object decks, source decks<br>Duplicate decks<br>Correct cards with obvious errors<br>Convert discettes to cards | Do not lift card files out of drawers from a higher position than waist high because of the weight of cards<br>Be aware of how full the drawer is and if help will be needed- of lower than waist be sure to bend knees when lifting<br>Potential back injury or sudden pull on arms to absorb weight of cards<br>No smoking in computer room - damage to storage media and equipment<br>Rooms should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br>Hands should be kept away from all moving parts<br>No liquids should be permitted in the computer room - will cause severe damage if spilled |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine when to update file | Improper label | Moisture damages cards<br><br>Folds in cards cause jams<br><br>Staples in cards damage equipment |

(TASK STATEMENT) MAINTAIN CARD FILES

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Resistance of materials to change in shape<br>[Rubber band pressure can damage cards]<br><br>BEHAVIORAL SCIENCE:<br>Maintain capacity to foster cooperation, and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br><br>Attributes of maximum functioning capacity:<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br><br>Conscious awareness of physical expressions basic to peak physical performance<br><br>Conscious awareness of qualities basic to optimal mental performance | Hindu-Arabic Numeral System<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Positive rationals<br>Use of numers (without calculation)<br>Counting<br>Ordering<br>Indexing<br>Coding<br>Ratio |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Update punched card files | Comprehension, Definition, Detail, Terminology |
| Writing | Update card files | Spelling, Classification, Logic |
| Viewing | Update card files | Visual analysis, Memory, Logic, Recognition of codes |

(TASK STATEMENT) INITIATE EMERGENCY TEST PROCEDURE

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Hardware operations manual | Listen to sound of machine<br><br>Interpret lights meanings by using manual - parity errors<br><br>Check basic items such as level of paper, forms, ribbon, fuses, lamps<br><br>Initiate check from control decks<br><br>Check conditions of run - bent, humidity | Equipment bread-downs may require changing fuses - power off electrical current<br>Electrical shock<br>No smoking in computer room - damage to storage media and equipment<br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br>Hands should be kept away from all moving parts<br>No liquids should be permitted in the computer room - will cause severe damage if spilled |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine when to repair problem or call field engineer | Incorrect alphabet, numbers or symbols<br><br>Parity error lights on C.P.U.<br><br>Console messages | Missing starwheels in key punch machine |

(TASK STATEMENT) INITIATE EMERGENCY TEST PROCEDURE

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Magnetic fields of force [avoid use of magnetics or foils adjacent to hard and soft ware]<br>Transfer of heat from one body to another<br>[Fuses, lights, switches]<br><br>BEHAVIORAL SCIENCE:<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Relates to : Comfort, Caution, Safety, and Physical, Emotional and Intellectual health<br>Conscious awareness of physical expressions basic to peak physical performance: Body rhythm, Breathing coordinated with body movement, Body balance and posture, Movement from tension to relaxation and vice versa<br>Conscious awareness of qualities basic to optimal mental performance: Attention, Observation, Concentration, Mental alertness, quietude and clarity, Organization | Positive rationals<br>Hindu-Arabic Numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Use of numbers (without calculation)<br>Counting, Coordinate system, Ordering, Indexing, Coding, Ratio, Measurement, Recording<br>Fundamental Operations (calculation)<br>Addition, Subtraction, Multiplication, and Division algorithms<br>Order of operations<br>Reduction of fractions, Changing mixed numbers to improper fractions, Changing % to fractions and fractions to %, Finding a % of a number and what % one number is of another, Changing fractions to decimal and decimals to fractions, Ratio and proportion, Estimation, Rounding off decimals |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, Codes, Emblems |

47

(TASK STATEMENT) OPERATE CARD READER

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Software<br>Run manual<br>Operation manual<br>Cards | Load data<br>Monitor data<br>Check run manual for special instructions<br>Unload data | Damaged line cords - electrical shock<br>Broken cord plugs - electrical shock<br>No smoking in computer room - damage to storage media and equipment<br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br>Hands should be kept away from all moving parts<br>No liquids in the computer room - severe damage if spilled |
| **DECISIONS** | **CUES** | **ERRORS** |
| Determine need for repair or call field engineer | Warning lights for feed check<br>Console messages | Malfunction in reader<br>Incorrect control cards |

86

(TASK STATEMENT) OPERATE CARD READER

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Basic understanding of function of optical and mechanical reading mechanisms<br>Light theory - optical contact<br>Electrical circuits - brush contact<br><br>BEHAVIORAL SCIENCE:<br>Maintain capacity to foster cooperation, and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Hindu- Arabic Numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Positive Rationals<br>Use of numbers (without calculation)<br>Counting<br>Ordering<br>Indexing<br>Coding<br>Fundamental Operations (calculation)<br>Addition, Subtraction, Multiplication, and Division algorithms<br>Order of operations, i.e. use of parentheses in simplifying arithmetic expressions |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Program [illegible] | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes, emblems |

(TASK STATEMENT) OPERATE CARD PUNCH

50

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Cards<br><br>Tape<br><br>Run manual<br><br>Operations manual<br><br>Rubber bands [around cards until files]<br><br>Felt pens [mark or label cards] | Load cards<br>Load program to be punched<br>Transfer data<br>Unload source program and file<br>Unload new deck, label, and file or route<br>Hollerith code - alpha and numeric punches<br>Program control - coding fields<br>Console instructions<br>Change fuses<br>Error correction<br>Manual duplication<br>Automatic duplication<br>Clear card jams | Broken cords and line plugs may cause electrical shock<br>Unplug the equipment when changing fuses<br>Keep fingers away from moving parts when operating equipment<br>No smoking in computer room - damage to storage media and equipment<br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br>No liquids should be permitted in the computer room - will cause severe damage if spilled |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine the correct position for all buttons and switches | Incorrect data | Card jams |

(TASK STATEMENT) OPERATE CARD PUNCH

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br><br>Maintain capacity to foster cooperation<br><br>Maintain capacity to function efficiently when encountering fast changing, multiple, personal or situational varibles<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Hindu-Arabic Numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Positive Rationals<br>Use of numbers (without calculation)<br>Counting<br>Ordering<br>Indexing<br>Coding<br>Fundamental operations (calculation)<br>Addition, Subtraction, Multiplication, and Division algorithms<br>Order of operations, i.e. use of parentheses in simplifying arithmetic expressions |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting instructions, manuals | Comprehension, Terminology, Instructions, Descreption of mechanism |
| Touching | Interpreting raw data, Keyboard skills | Speed/rate, Pressure, etc. |

51

(TASK STATEMENT) OPERATE LINE PRINTER

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Ribbon [printer]<br><br>Print-out paper<br><br>Forms<br><br>Paper tapes-vertical format tape VFU<br><br>Hardware reference manual<br><br>Carriage control tape punch<br><br>Glue<br><br>Scissors | Select proper form for project<br><br>Make VFU tape (or prepare carriage control tape)<br><br>Maintain ribbon in good shape by replacing as wears<br><br>Monitor-(make sure nothing happens)<br><br>Separate forms and route to next station<br><br>Vacuum clean printer when needed | Keep hands away from machine<br><br>Keep fingers away from moving parts when operating printer-pinch-points, hand and finger injuries<br><br>No smoking in computer room-damage to storage media and equipment<br><br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br><br>No liquids in the computer room-severe damage if spilled |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine position for all buttons and switches | Incorrect spacing and poor visibility of print | Line space switch in incorrect position |

52

(TASK STATEMENT) OPERATE LINE PRINTER

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Resistance of materials to change in shape [ punching VFU tape]<br><br>BEHAVIORAL SCIENCE:<br><br>Maintain capacity to foster cooperation, and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Hindu-Arabic<br>Number/numeral<br>Place value/expanded notation<br>Contrast and compare various base number systems with our decimal numeral system<br>Positive Rationals<br>Use of Numbers (without calculation)<br>Counting, Ordering, Indexing, Coding<br>Fundamental Operations (calculation)<br>Addition, Subtraction, Multiplication, and Division algorithms<br>Order of operations, i.e. use of parentheses in simplifying arithmetic expressions |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpreting operational manuals, Program languages | Comprehension, Detail, Informational reports, Description of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes, emblems |

(TASK STATEMENT) **OPERATE OPTICAL I/O DEVICES**

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Optical display or cathode ray tube (CRT) terminal [Hazeltine 2000 or IBM 2260]<br><br>Electric pencil<br><br>Operation run manual<br><br>XY plotters<br><br>Microfilm<br><br>Optical scanner(OCR) | Enter data through keyboard or optical scanner<br>Transmit to computer<br>Receive computer-generated data and displayed visually<br>Analyze data<br>Modify display via keyboard or electric pencil<br>Store new data in computer<br>Store on magnetic tape cassette for input-output if required by job<br>Utilize XY ink plotters to obtain hard copy if job requires (hard copy)<br>Employ microfilm if job requires (hard copy)<br>Record transactions in run manual<br>Route hard copy to next station | Damaged or worn parts may cause hand injuries - electrical shock<br><br>No smoking in computer room - damage to storage media and equipment<br><br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br><br>Hands should be kept away from all moving parts<br><br>No liquids should be permitted in the computer room - severe damage if spilled |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine speed and accuracy of job to be performed | Data not generated by computer | Syntax errors |

(TASK STATEMENT) OPERATE OPTICAL I/O DEVICES

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Resistance of materials to flow of electrical current<br>[understand electrical flow characteristics, fuse failure etc., reading mechanism basic to understanding of optical reading mechanisms]<br><br>BEHAVIORAL SCIENCE:<br>Attributes of maximum functioning capacity<br><br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation. Relates to: Comfort, Caution, Safety, and Physical, emotional, and intellectual health<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance: attention, observation, concentration, mental alertness, mental quietude, mental clarity, and organization | Binary numbers<br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Positive Rationals<br>Use of Numbers (without calculation)<br>Counting<br>Ordering<br>Coding<br>Indexing<br>Fundamental Operations (calculation)<br>Addition, Subtraction, Multiplication and Division algorithms<br>Order of operations, i.e. use of parentheses in simplifying arithmetic expressions |

55

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Store new data in computer | Comprehension, Detail, Terminology |
| Writing | Store new data in computer | Spelling, Classification, Logic Terminology |

55

(TASK STATEMENT) LOAD AND OPERATE DISK DRIVES OR CARTRIDGES

56

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Disk pack or cartridge<br>Cleaning materials–dust free cloth, solvent for cleaning wood blade<br>Run log (manual)<br>Labels | Load; pull disk for operation as instructed by run manual or console code; hold disk pack container firmly by top handle, turn locking knob on bottom plate allowing the plate to be removed; stop unit, open cover and place pack on spindle (still in cover)<br>Rotate cover in direction of "ON" arrow until firm resistance is met and left off; store empty container;<br>Close disk unit; move start/stop switch to start which causes rotation and pack surface is cleaned and position read/write bends; move enable/disable switch to enable; feel top of disk drives with hand to see if disk has stopped spinning; listen to card reader to hear if it is accepting a card or if it is jammed, and listen to line printer to hear if it becomes jammed while printing output | Hazard: Electrical shocks<br><br>Safety: Power down according to weather forecasts<br>Follow tornado warnings, etc.<br><br>Keep pack in closed container when not in use (never touch or leave exposed, the disk edges or surfaces)<br>Label material with adhesive stickers that are removable<br>Keep exterior surface of container clean and dust-free |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine the correct disk and proper drive to be used | Pariting shown on computer lights | A disk cartridge carried through a security metal detector at airports will have its data erased<br>Handle disk with care–if dropped or damaged, data stored on it is lost and cannot be mounted on disk drive<br>Never lay a disk pack or cartridge upon disk drives–magnetic field will erase all information on disk<br>Never open disk unit cover unless disk drive is stopped |

(TASK STATEMENT) LOAD AND OPERATE DISK DRIVES OR CARTRIDGES

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Disk hazard - electronic principles about magnetic fields<br><br>BEHAVIORAL SCIENCE:<br>Attributes of maximum functioning capacity<br><br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Hindu-Arabic numeral system<br>Number/numeral<br>Place value/ expanded notation<br>Contrast and compare various base number systems with our decimal numeral system<br>Use of Numbers (without calculation)<br>Counting<br>Ordering<br>Indexing<br>Coding [disk serial numbers] |

57

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Writing | Record memory storage | |
| Reading | Interpreting operational manuals, Program languages | Comprehension, Detail, Informational reports, Discription of mechanism, Definition, Terminology |
| Viewing | Interpretation of operating manuals | Visual analysis, Memory, Recognition of symbols, codes, emblems |

(TASK STATEMENT) OPERATE TELETYPEWRITER TERMINALS

58

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Teletype unit TTY<br><br>8 chanel ASC 11 code tape<br><br>Telephone | Load paper tape - align<br><br>Press keys and 8-bit ASC 11 code character is generated<br><br>Receive coded character which operates typewriter print mechanism<br><br>Attach phone or connect to main transmission lines to transmit to computer<br><br>Computer receives data / or transmits to TTY terminal<br><br>Unload tape or paper with transmitted message<br><br>Route to next station | Check for damaged or worn cords and plugs - electrical shock<br><br>Keep fingers away from print keys when equipment is operating - print carriage may cut fingers |
| **DECISIONS** | **CUES** | **ERRORS** |
| Determine speed and accuracy for messages | Parity shown on computer lights | Malfunction in acoustic coupler to convert between the electrical signals and sound signals<br><br>Misaligned paper tape<br><br>Paper tape not completely punched out |

58

(TASK STATEMENT) OPERATE TELETYPEWRITER TERMINALS

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Magnetic fields of force<br>Transfer of heat from one body to another<br>Resistance of materials to flow of electrical current<br><br>BEHAVIORAL SCIENCE:<br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br><br>Use of numbers (without calculation)<br>Counting<br>Ordering<br>Indexing |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Store new data in computer | Comprehension, Detail, Terminology |
| Writing | Store new data in computer | Spelling, Classification, Logic Terminology |

(TASK STATEMENT) OPERATE ON LINE SYSTEMS

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| On line equipment<br>Tapes drives<br>Disks drives<br>Line printer<br>Console<br>Card punch<br>Card reader<br>Terminals | Monitor instructions from on line systems<br>Respond with computer through keyboard and printer<br>Call in appropriate tape or disk to do procedure<br>Monitor procedure and response<br>Troubleshoot | Damaged cords and plugs - electrical shock<br>Keep fingers away from moving parts ie., pinch points - hand and finger injuries<br>No smoking in computer room-damage to storage media and equipment<br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br>No liquids should be permitted in the computer room - sever damage if spilled |
| **DECISIONS** | **CUES** | **ERRORS** |
| Respond to problems in hardware or software | Parity light on computer<br>Computer console messages | Breakdown<br>Software problems |

(TASK STATEMENT) OPERATE ON LINE SYSTEMS

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Apply computer science<br><br>BEHAVIORAL SCIENCE:<br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation Relates to : Comfort, Caution, Safety, and Physical, Emotional and Intellectual health<br>Conscious awareness of physical expressions basic to peak physical performance: Body rhythm, Breathing Coordinated wihh body movement, Body balance and posture, Movement from tension to relaxation and vice versa<br>Conscious awareness of qualities basic to optimal mental performance: Attention, Observation, Concentration, Mental alertness, Mental quietude, Mental clarity, Organization | Positive rationals<br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/extended notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Use of numbers (without calculation)<br>Counting, Coordinate system, Ordering<br>Fundamental operations (calculation)<br>Addition, Subtraction, Multiplication and Division algorithms<br>Order of operations, i.e. use of parentheses in simplifying arithmetic expressions |

19

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Communicate with on line systems problems that are incurred to keep them posted of what is happening<br><br>Communicate with other areas of capabilities of computer | DR Date Reset<br>TR Time Reset<br>TD Time and Date | Interpretation of mnemonics |

(TASK STATEMENT) UPDATE MANUALS

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Operations manual | Receive update on hardware (technical notes)<br><br>File in operations manual<br><br>Receive update in programming file and route to programmers | No smoking in computer room-damage to storage media and equipment<br><br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br><br>Hands should be kept away from all moving parts<br><br>No liquids should be permitted in the computer room-severe damaged if spilled |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine a simplified language easily understood by all users | Language too difficult for average user | Not saving and filing updated material and then using them |

62

(TASK STATEMENT) UPDATE MANUALS

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Professionalism:<br>Maintain capacity to foster cooperation<br>Maintain capacity to function efficiently when encountering fast changing, multiple, personal or situational varibles<br>Exibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability<br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Positive rationals<br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Compare and contrast various base number systems with our decimal numeral system<br>Use of numbers (without calculation)<br>Counting, Coordinate system, Ordering, Indexing, Ratio, Coding [disk serial numbers]<br>Fundamental operations (calculation)<br>Addition, Subtraction, Multiplication and Division Algorithms<br>Order of operations<br>Reduction of fractions, Changing mixed numbers to improper fractions, Changing % to fractions and fractions to %, Finding a % of a number and what % one number is of another, Changing fractions to decimal and decimals to fractions, Rounding off decimals and whole numbers |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Store new data in computer | Comprehension, Detail, Terminology |
| Writing | Store new data in computer | Spelling, Classification, Terminology, Logic |

Duty C Supervising Programming

1 Analyze the problem
2 Program flow charts
3 Develop programs
4 Assemble or compile the object program
5 Test and correct the program
6 Prepare the program for production

64

(TASK STATEMENT) ANALYZE THE PROBLEM

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Source data<br><br>Layout sheets-cards tape, printer disc<br><br>Printer space guide<br><br>Pens, pencils<br><br>Flow chart forms | Analyze programs or evaluation, reviews or report for problem identification<br>Prepare documentation, including formats and layouts for input and output media and formulas a) report format, b) layout of punched tape<br>Prepare layout for storage: magnetic tape, disc, card<br>Identify problem areas in the system<br>Develop program logic charts for machine routine<br>Develop operation procedures for program<br>Prepare instructions for operation of on line peripheral equipment<br>Perform systems analysis to meet requirements of company functions<br>Review existing routines for applicability of new techniques | Improper lighting |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine if problem can be efficiently done on hardware available<br>Decide if there is a similar program that can be used<br>Decide if the expense involved warrants the job to be done<br>Determine best method for processing, storage, and retrieval techniques<br>Determine recommendations such as corrections or possible modifications<br>Determine if job is necessary | Problem not clearly defined | Accept job that has not been fully thought out and will be useless at completion of program |

65

(TASK STATEMENT) ANALYZE THE PROBLEM

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br>SUPERVISION<br>Distribute personnel with regard to leadership qualities and experiences for optimum team performance<br>Maintain customer's illusion of privacy by avoiding excessive noise or movement<br>Grant appropriate regard for customer's personal space<br>Grant conscious attention to smoothly flowing team work<br>Maintain regard for differing views on maximum efficiency of operations<br>Grant appropriate regard for customer's unique needs<br>Exhibit capacity to ascertain best service for the particular party type requested<br>Show and describe facilities with appropriate speed and clarity<br>Communicate pride in establishment | Hindu-Arabic numeral system<br>Number/numeral, Place value/expanded notation<br>Use of numbers (without calculation)<br>Counting, Ordering, Indexing<br>Fundamental Operations (calculation)<br>Addition, Subtraction, Multiplication, Division algorithms<br>Order of operations<br>Reduction of fractions, Changing mixed numbers to improper fractions, Changing % to fractions and fractions to %, Finding a % of a number and what % one number is of another, Changing fractions to decimal and vice versa, Rounding off decimals and whole numbers, Property of comparison - equality/equivalence or inequality/greater than/less than, Multiplication by zero<br>Use of computing devices and mechanical aids - Computers<br>Measurement: non-geometric<br>Time, Money<br>Positive rationals |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Read and interpret regulations, manuals, or administrative orders | Logic for defining a problem |
| Writing | Communicate with programmers the desired output as dictated by the person who will use reports | |
| Speaking | Communicate with programmers the desired output as dictated by the person who will use the reports | |

(TASK STATEMENT) PROGRAM FLOW CHARTS

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Flow chart forms<br><br>Programming template | Prepare general block flow chart define primary storage, identify output/input device, reserve storage areas, assign names, generate constant data in primary storage<br>Prepare systems flow chart<br>Develop logic charts for machine routine<br>Develop flow charts for handling source data by off-line support equipment<br>Develop standard element and codes for function areas<br>Prepare documentation for systems flow chart<br>Coordinate flow of data from one report to another<br>Analyze job steps to determine data recovery points<br>Develop standard elements and codes for functions areas | Improper lighting |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine logical order in which data should flow | Omitted step for data flow | Incomplete flow of data |

(TASK STATEMENT) PROGRAM FLOWCHARTS

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br>Maintain capacity to foster cooperation<br>Maintain capacity to function efficiently when encountering fast changing, multiple, personal, or situational varibles<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br><br>Conscious awareness of physical expressions basic to peak physical performance<br><br>Conscious awareness of qualities basic to optimal mental performance | Positive Rationals<br>Hindu-Arabic numeral system<br>Number/numeral, Place value/expanded notation<br>Use of numbers (without calculation)<br>Counting, Indexing, Coding [flow chart symbols]<br>Fundamental operations (calculation)<br>Addition, Subtraction, Multiplication, Division algorithms<br>Order of operations<br>Property of comparison<br>equality/equivalence, inequality/greater than/less than<br>Use of computing devices and mechanical aids - computers<br>Solve problems involving numerical algebraic expressions<br>Instruments: [flow chart templates, ruler]<br>Use of variables - in formulae, in equations<br>Write as a formula or equation a relationship given in words<br>Manipulation of formulae,<br>Substitute given values in order to find the value of the required unknown |

89

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Charts | Logic, interpretation of flow chart symbols |
| Writing | Charts | |

(TASK STATEMENT) DEVELOP PROGRAMS

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Coding sheets for R.P.G. and COBOL<br>Reference manual of language<br>Reference manual - debugging<br>Keypunch<br>Line printer spacing<br>Pencils<br>Pens | Select best language for desired result<br>Receive systems flow chart and analyze<br>Receive format for input and output<br>Receive instructions for type of program required<br>Develop procedure flow chart<br>Adapt programs written in symbolic language to different computer configuration<br>Select sub programs ( if available)<br>Develop sub program<br>Code routine programs<br>Patch computer programs<br>Revise routine program<br>Utilize package programs when available<br>Develop operations procedures for programming - run manual, log | Must completely think out project logically to prevent errors and save time in debugging |
| **DECISIONS** | **CUES** | **ERRORS** |
| Select most efficient programs | | Not meeting requirements for what was wanted by department |

69

(TASK STATEMENT) DEVELOP PROGRAMS

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| Use programming languages<br>Science - Fortran<br>Business - COBOL<br>Other languages APL, Basic, Assembler, RPG, Jovial<br>Gestalt<br><br>Use basic accounting principle - accounting cycle<br>Payroll — Accounts receivable<br>Inventory — Accounts payable<br>BEHAVIORAL SCIENCE:<br>Professionalism: Maintain capacity to foster cooperation, to function efficiently when encountering fast changing multiple, personal or situational varibles; Exhibit qualities of self-confidence, self-control, self-reliance<br>Attributes of maximum functioning capacity<br>Conscious awareness of physical expressions basic to peak performance and qualities basic to optimal mental performance | Fortran - complete math background<br>Science languages - complete math background<br>Business language - basic math<br>Addition and subtraction of whole numbers<br>Multiplication and division with whole numbers<br>Reduction of fractions<br>Addition and subtraction of decimal fractions<br>Multiplication and division of decimal fraction<br>Rounding off decimals and whole numbers |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Read flow charts and instructions | Logic, interpretation of computer language |
| Writing | Communicate what is possible in programming | |
| Speaking | Communicate what is possible in programming | |

(TASK STATEMENT) **ASSEMBLE OR COMPILE THE OBJECT PROGRAM**

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Program<br><br>Medial where supervisor programs stored and where empty storage for new object deck<br><br>Cards<br>Disks<br>Tapes<br><br>Run manual<br><br>Sample data | Load supervisor program and programs needed to compile<br>Prepare control cards<br>Assemble source deck to compile for syntax<br>Load new program<br>Compile object<br>Scan for obvious errors<br>Take object and document in run manual<br>Take sample test and data<br>Route sample program and test run to programmer for debugging | No smoking in computer room - damage to storage media and equipment<br><br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br><br>Hands should be kept away from all moving parts<br><br>NO liquids should be permitted in the computer room - severe damage if spilled |
| **DECISIONS** | **CUES** | **ERRORS** |
| Determine the correct coding sheets | No compile<br>Display lights on C.P.U. | Syntax errors in writing or punching program |

(TASK STATEMENT) ASSEMBLE OR COMPILE THE OBJECT PROGRAM

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Relates to : Comfort, Caution, Safety, and Physical, Emotional and Intellectual health<br>Conscious awareness of physical expressions basic to peak physical performance: Body rhythm, Breathing coordinated with body movement, Body balance and posture, Movement from tension to relaxation and vice versa<br>Conscious of qualities basic to optimal mental performance: Attention, Observation, Concentration, Mental alertness, Mental quietude, Mental clarity, Organization | Positive rationals<br><br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br><br>Use of numbers (without calculation)<br>Counting<br>Ordering<br>Indexing<br>Coding [disk codes or serial numbers] |

72

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interpret run manual | Logic, interpretation of computer languages |

72

(TASK STATEMENT) **TEST AND CORRECT THE PROGRAM**

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| **Program**<br><br>Layout sheets<br><br>Reference manual<br>language<br>operations<br>error chart<br><br>Pencils, pens, felt pens<br><br>Keypunch | Receive program from operator<br>Check acceptability for errors<br>Correct mechanical errors<br>Use reference manual to check what error code represents<br>Correct logic errors<br>Correct cards or have data entry prepare<br>Route to operator for compilation<br>Send sample data for test<br>Check sample results for accuracy<br>Recheck logic<br>Route to next station | **No smoking in computer room-damage** to storage media and equipment<br><br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br><br>Hands should be kept away from all moving parts<br><br>No liquids should be permitted in the computer room - sevare damage if spilled |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine the desired outcome of program | Major syntax erros | **Time to find errors**<br><br>No compile |

(TASK STATEMENT) TEST AND CORRECT THE PROGRAM

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br><br>Attributes of maximum functioning capacity<br><br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation Relates to : Comfort, Caution, Safety, and Physical, Emotional and Intellectual health<br>Conscious awareness of physical expressions basic to peak physical performance: Body rhythm, Breathing coordinated with body movement, Body balance and posture, Movement from tension to relaxation and vice versa<br>Conscious awareness of qualities basic to optimal mental performance: Attention, Observation, Concentration, Mental alertness, Mental quietude, Mental clarity, and Organization | Binary and Hexidecimal<br><br>Positive rationals<br><br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br><br>Use of numbers (without calculation)<br>Counting<br>Indexing |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Program and reference material | Logic, interpretation of computer language |

74

(TASK STATEMENT) PREPARE THE PROGRAM FOR PRODUCTION

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Run manual<br><br>Program | Integrate planned routines with overall programming<br>Coordinate operations with preparation of computer operating instructions<br>Coordinate with operations, programs or systems personnel on matters of joint interest<br>Prepare control card sheets for utility or library programs<br>Maintain library documentation of general purpose and utility programs<br>Analyze job steps to determine data recovery points<br>Develop program test and maintenance systems<br>Review machine run reports for accuracy<br>Determine size and time element of processing runs<br>Recommend corrections or modifications to systems<br>Audit computer inputs after test run and follow-up<br>Prepare console operator run book | No smoking in computer room-damage to storage media and equipment<br><br>Room should be kept air-conditioned and humidity controlled as the CPU will not work with accuracy when too warm<br><br>Hands should be kept away from all moving parts<br><br>No liquids should be permitted in the computer room-severe damage if spilled |
| **DECISIONS** | **CUES** | **ERRORS** |
| Determine if program meets desired need and output | Improper output device | Time lost |

(TASK STATEMENT) PREPARE THE PROGRAM FOR PRODUCTION

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br>Professionalism<br>Maintain capacity to foster cooperation<br>Maintain capacity to function efficiently when encountering fast changing, multiple, personal or situational varibles<br>Exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability<br>Attributes of maximum functioning capacity<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Positive rationals<br><br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br><br>Use of numbers (without calculation)<br>Counting<br>Indexing<br>Coding [interpret flow chart, symbols] |

| COMMUNICATIONS | | |
|---|---|---|
| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
| Reading | Read flowcharts | Logic, interpretation of computer language |

76

Duty D Maintaining a Systems Library

1 Store according to prearranged order data files, programs, and documentations
2 Lend and receive data according to a set procedure
3 Maintain security and protection of stored data

77

(TASK STATEMENT) STORE ACCORDING TO PREARRANGED ORDER DATA FILES, PROGRAMS AND DOCUMENTATIONS

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| File cabinets<br>Work tables<br>Storage shelves<br>Metal tape containers<br>Repairing supplies<br>Transporting carts<br>File guides and tabs<br>File folders<br>Typewriters<br>Calculating machine<br>Photo copy machine<br>Step stool<br>File labels | Label each record or file<br><br>Place record or file in container<br><br>Transport records or files on cart<br><br>Maintain a perpetual inventory or stored data<br><br>Place records and files in a specified location | SAFETY:<br>Do not lift heavy loads [25 lbs., or more from a bending position]<br><br>HAZARD:<br>Potential back injury |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine proper label<br><br>Determine specified location for storage | Misplaced or misfiled data | Difficulty in retrieving<br><br>Destroying records |

(TASK STATEMENT) STORE ACCORDING TO PREARAANGED ORDER DATA FILES, PROGRAMS AND DOCUMENTATION

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| **Principle:** Moisture and certain temperatures can damage paper and tapes<br><br>**Concepts:** Temperature, Humidity, Sunlight<br><br>BEHAVIORAL SCIENCE:<br>Student librarian should be alerted to the dangers of exposing stored data to unauthorized personnel<br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Positive rationals<br>Hindu-Arabic numeral system<br>Number/numeral Place value/expanded notation<br>Fundamental operations (calculation)<br>Addition, Subtraction, Multiplication, and Division Algorithms<br>Order of operations<br>Use of computing devices and mechanical aids<br>Electric and mechanical calculators<br>Computers<br>Use of numbers (without calculation)<br>Coding [read binary code]<br>Conversion from one standard unit to another |

75

## COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Checking titles | Speed/rate, Terminology, Comprehension |
| Writing | Categorize records | Logic, Description, Memo format |
| Speaking | Acknowledging requisites | Enunciation |

(TASK STATEMENT) LEND AND RECEIVE DATA ACCORDING TO A SET PROCEDURE

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Typewriter<br>Stationery<br>Calculator<br>Photo copier | Under supervision establish and maintain a achedule for data use<br>Lend data files to appropriate individuals and departments<br>Receive and replace lent files | Do not lift heavy loads<br>Potential back injury or rupture |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Decide how to schedule data use to meet company deadlines | Incomplete files | Late report<br>Misscheduled data use<br>Mismanagement and confusion |

(TASK STATEMENT) LEND AND RECEIVE DATA ACCORDING TO A SET PROCEDURE

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br>Principle: Human frustrations develop from unmet needs<br><br>Concepts: Consideration<br>Cooperation<br>Tact<br>Situational variables<br>Team performance<br><br>Professionalism<br>Maintain capacity to foster cooperation, and to function efficiently when encountering fast changing, multiple, personal or situational variables<br>Exhibit qualities fo self-confidence, self-control, self-reliance, self-respect, and adaptability<br><br>Attributes of maximum functioning capacity | Positive rationals<br>Fundamental operations (calculation)<br>Addition, Subtraction, Multiplication, and Division alogrithms [whole numbers]<br>Order of operations<br><br>Use of numbers (without calculation)<br>Counting<br>Indexing<br>Coding [alphabetic, numeric, alphanumeric codes] |

18

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Comprehending written instructions | Comprehension, Speed/rate, Terminology, Instructions |
| Listening | Receiving verbal requests | Logic, Note taking, Discriminate facts from non-facts |
| Speaking | Acknowledging requests or express opinions | Enunciation, Clarity of expression |

(TASK STATEMENT) MAINTAIN SECURITY AND PROTECTION OF STORED DATA

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Typewriter<br>Stationery<br>Calculating machine<br>Telephone<br>Burglar alarm<br>Television surveillance equipment | Under supervision, screen personnel who request to use stored data<br>Routine inspection of stored data containers<br>Prepare perpetual inventory of stored data | SAFETY:<br>Do not lift heavy loads<br>Maintain paper temperature and humidity levels<br>HAZARD:<br>Potential back injury or rupture<br>Possible destruction of data |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Judge unauthorized use of data<br>Determine when to notify ''security personnel''<br>Determine accusations | Lost data | Stolen files<br>Destroying<br>Confidentiality<br>Accusations - false |

28

(TASK STATEMENT) MAINTAIN SECURITY AND PROTECTION OF STORED DATA

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br><br>Principle: Capacity to perceive, quickly integrate, and function well in the face of unexpected varibles<br><br>Concepts: Confidentiality, Authority, Commitment, Awareness, Fear accusing, First impression, Hostility, Curiosity, Control, Comparison, Expectations<br><br>Professionalism<br>Attributes of maximum functioning capacity | Positive rationals<br>Hindu-Arabic numeral system<br>Number/numeral<br>Place value/expanded notation<br>Fundamental operations (calculation)<br>Addition, Subtraction, Multiplication, and Division algorithms [of whole numbers, fractions and decimals]<br>Order of operations<br>Use of computing devices and mechanical aids<br>Calculators [input and operate calculator]<br>electric<br>mechanical |

83

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Speaking | **Screening personnel** | Logic, Implying, Usage |
| Listening | Request to use data | Detection of propaganda devices, Recognize opinions, Descriminate fact from non-fact |
| Writing | Response to written requests | Classification |

Duty E Performing Basic Business Applications for Processing Data

1 Process sales orders
2 Process shipping orders
3 Prepare invoices
4 Process accounts receivable
5 Process accounts payable
6 Calculate payroll
7 Process inventory control
8 Prepare financial statements

84

(TASK STATEMENT) PROCESS SALES ORDERS

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Paper<br>Sales order forms<br>Pencils, pens<br>Carbon paper<br>Purchase order forms<br>Postage stamps<br>Telephone<br>Typewriter<br>Calculator | Receive telephone sales orders<br>Receive orders from salesperson<br>Purchase orders through mail and by telegram<br>Submit orders to keypunch operator | Hazards: Improper lighting |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine ease and accuracy of filling orders | Incorrect oral information | Mistakes in shipping, billing |

(TASK STATEMENT) PROCESS SALES ORDERS

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br><br>Professionalism:<br>Maintain capacity to foster cooperation<br>Maintain capacity to function efficiently when encountering fast changing, multiple, personal or situational variables<br>Exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance | Use of Numbers (without calculation)<br>Counting<br>Indexing<br>Fundamental operation (calculation)<br>Addition, Subtraction, Multiplication and Division algorithms [whole numbers]<br><br>Reduction of fractions<br>Changing mixed numbers to improper fractions<br>Changing percents to fractions and fractions to percents<br>Use of computing devices and mechanical aids<br>Calculators<br>electric<br>mechanical |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Speaking | Taking orders | Terminology, Appropriate diction, Enunciation, Poise, Usage |
| Reading | Understanding order forms | Comprehension, Speed, Terminology |
| Writing | Filling out order forms | Penmanship, Spelling , Classification |
| Listening | Taking orders | Auditory discrimination, Discriminate facts, Concentration, Note taking |
| Viewing | Understanding order forms | Recognition of symbols, codes, emblems |

(TASK STATEMENT) PROCESS SHIPPING ORDERS

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Paper, pencils, pens<br>Shipping order forms<br>Carbon paper<br>Master files<br>Telephone<br>Typewriter<br>Adding machine<br>Calculator | Check customer codes, names and addresses against master files<br>Check item codes, prices and descriptions against item master files<br>Check credit if new customer<br>Arrange for assembly and shipping order<br>Write and send shipping order | Hazards: Paper cuts<br>Improper lighting |
| **DECISIONS** | **CUES** | **ERRORS** |
| Determine speed and accuracy of filling orders | Questionable credit rating<br>Difference between master file information | Possible bad debts<br>Delivery and price mistakes |

(TASK STATEMENT) PROCESS SHIPPING ORDERS

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br>Professionalism:<br>Maintain capacity to foster cooperation<br>Maintain capacity to function efficiently when encountering fast changing, multiple, personal or situational variables<br>Attributes of maximum functioning capacity<br>Conscious awareness of physical expressions basic to peak physical performance<br>Conscious awareness of qualities basic to optimal mental performance<br>Conscious awareness of need for a balance (both physical and mental) between tension and relaxation | Positive rationals<br>Hindu-Arabic numeral system<br>Number/numeral, Place value/expanded notation<br>Use of numbers (without calculation)<br>Counting, Indexing, Coding, Ratio<br>Fundamental operations (calculation)<br>Addition, subtraction, multiplication, division algorithm<br>Order of operations<br>Reduction of fractions, Changing mixed numbers to improper fractions, changing % to fractions and vice versa, Finding a % of a number and what % one number is of another, Changing fractions to decimal and vice versa, Rounding off decimals and whole numbers, Guess and check method, Rule of thumb, Property of comparison-equality/equivalence, and inequality/greater than/less than<br>Use of computing devices and mechanical aids<br>Calculators-electric and mechanical, computers<br>''Measure sense''/role of ''unit''<br>Instruments; rate<br>Measurements: non-geometric<br>Time, money, temperature, weight, liquid, dry |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Checking information | Comprehension, detail/inference, speed/rate, information reports, terminology, instructions |
| Writing | Preparing shipping order | Penmanship, spelling, instructions, business letters, clarity of expression, usage |

(TASK STATEMENT) PREPARE INVOICES

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Pencils, Pens, Paper<br>Invoice forms<br>Blank cards<br>Magnetic tape<br>Card layout forms<br>Keypunch equipment<br>Verifier<br>Adding machines<br>Calculators | Receive shipping order<br>Keypunch all invoice data<br>Extend invoices<br>Total invoices<br>Calculate discounts<br>Record amount of discount on invoice<br>Mail invoice | Hazards: Paper cuts<br>Improper lighting<br>Electrical machinery should be unplugged when making any mechanical changes |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine speed and accuracy for preparing invoices | Cancelled or back-ordered merchandise | Billing mistakes |

(TASK STATEMENT) PREPARE INVOICES

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br>Professionalism<br>Maintain capacity to foster cooperation, to function efficiently when encountering fast changing multiple, personal or situational varibles<br>Exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of physical expressions basic to peak physical performance: Body rhythm, Breathing coordinated with body movement, Body balance and posture, Movement from tension to relaxation and vice versa<br>Conscious awareness of qualities basic to optimal mental performance: Attention, Observation, Concentration, Mental alertness, Mental quietude, Mental clarity, Organization<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation. Relates to: comfort, caution, safety, and physical, emotional, and intellectual health | Positive rationals<br>Fundamental operations (calculation): addition, subtraction, multiplication, division algorithm; order of operations<br>Hindu-Arabic numeral system<br>Number/numeral, Place value/expanded notation<br>Use of numbers (without calculation): counting, coding [company code RE: stock numbers]<br>Basic arithmetic skills and concepts with reference to the company's particular product: reduction of fractions, changing mixed numbers to improper fractions, changing % to fraction and vice versa; finding a % of a number and what % one number is of another; changing fractions to decimal and vice versa; rounding off decimals & whole numbers; guess & check method; rule of thumb-estimation of totals; property of comparison-equality/equivalence and inequality/greater than/less than<br>Write as a formula or equation a relationship given in words; substitute given values in order to find the value of the required unknown; solve problems involving numerical algebraic expressions<br>Use of computing deivces and mechanical aids<br>calculators-electric and mechanical, computers<br>Measurement: geometric-linear, area, volume<br>Measurement: non-geometric-time, money, weight, liquid, dry<br>Conversion from one standard unit to another; read and interpret tables, charts and graphs [sales tax tables];<br>Use of variables; manipulation of formulae [extension = Qty. x Price] |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading<br>Writing<br>Viewing | Understanding shipping orders<br>Invoice information<br>Interpretation of payment terms | Comprehension, Speed/rate, Terminology<br>Spelling, Usage<br>Recognition of symbols, codes, emblems |

(TASK STATEMENT) PROCESS ACCOUNTS RECEIVABLE

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Pencils, paper, pens<br>Blank cards<br>Card layout forms<br>Printer layout forms<br>Customer record forms<br>Ledger cards<br>Keypunch<br>Verifier<br>Magnetic tape<br>Disk<br>Sorter | Collect source data ie., invoices, credit and debit memos, payment vouchers, etc.<br>Prepare now account data cards<br>Add, delete, or change information on master records in card files<br>Record periodic transactions | Hazards: Paper cuts<br>Improper lighting<br>Electrical shocks from electrical equipment |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine speed and accuracy for processing accounts | Importance of basic clerical accuracy | Loss of revenue to company<br>Loss of customers<br>Shipping delays |

(TASK STATEMENT) PROCESS ACCOUNTS RECEIVABLE

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br>Professionalism:<br>Maintain capacity to foster cooperation and to function efficiently when encountering fast changing, multiple personal or situational variables<br>Exhibit qualities of self-confidence, self-control, self-reliance, self respect and adaptability<br>Attributes of maximum functioning capacity<br>Conscious awareness of physical expressions basic to peak performance and qualities basic to optimal mental performance<br>Conscious awareness of need for a balance (both physical and mental) between tension and relaxation | Positive rationals<br>Hindu-Arabic numeral system<br>Number/numeral, Place value/expanded notation<br>Use of numbers (without calculation)<br>Counting, Indexing, Ratio<br>Addition, Subtraction, Multiplication, Division algorithms<br>Order of operations<br>Reduction of fractions, Changing mixed numbers to improper fractions, Changing % to fractions and vice versa, Finding a % of a number and what % one number if of another, Changing fractions to decimal and vice versa, Rounding off decimals and whole numbers, Guess and check method, Property of comparison, Multiplication by zero,<br>Use of computing devices and mechanical aids<br>Calculators-electric and mechanical, computers<br>Depending of product of company<br>''Measure sense''/role of ''unit'', Instruments, Rate<br>Measurement: geometric-linear, area, volume<br>Measurement: non-geometric-time, money, temperature, weight, liquid, dry |

92

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading | Interprets source material | Comprehension, Speed/rate, Terminology |
| Writing | Preparing input data | Spelling, Classification |
| Viewing | Preparing input data | Recognition of symbols |

(TASK STATEMENT) PROCESS ACCOUNTS PAYABLE

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Pencil, Paper, Pens<br><br>Blank cards<br><br>Card layout forms<br><br>Printer layout forms<br><br>Customer record forms<br><br>Keypunch<br><br>Verifier<br><br>Magnetic tape<br><br>Disk<br><br>Sorter | Collect source data, ie., purchase orders, receiving records, vendor invoices, payment checks<br><br>Prepare new account data cards<br><br>Add, delete, or change information on master records in card files<br><br>Record periodic transactions | Hazards: Paper cuts<br>Improper lighting<br>Electrical shock |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine importance of basic clerical accuracy | Incorrect decimal point | Over payments<br><br>Loss of discounts<br><br>Possible bad credit rating |

(TASK STATEMENT) PROCESS ACCOUNTS PAYABLE

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br>Professionalism:<br>Maintain capacity to foster cooperation and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br>Exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of physical expressions basic to peak physical performance: body rhythm, breathing coordinated with body movement, body balance and posture, movement from tension to relaxation and vice versa<br>Conscious awareness of qualities basic to optimal mental performance: attention, observation, concentration, mental alertness, mental quietude, mental clarity, organization<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation. Relates to: comfort, caution, safety, and physical, emotional, and intellectual health | Positive rationals<br>Hindu-Arabic numeral system<br>Number/numeral, Place value/expanded notation<br>Use of numbers (without calculation): counting, indexing, ratio<br>Addition, subtraction, multiplication, division algorithms; order of operations; reduction of fractions; changing mixed numbers to improper fraction; changing % to fractions and vice versa; finding a % of a number and what % one number is of another; changing fractions to decimal and vice versa rounding off decimals and whole numbers; guess and check method; property of comparison; multiplication by zero<br>Use of computing devices and mechanical aids<br>calculators–electric and mechanical, computers<br>Depending on product of company: ''measure sense''/role of ''unit'', instrument, rate; Measurement: geometric – linear, area, volume; conversion from one standard unit to another; Measurement: non-geometric - time, money, weight, temperature, liquid, dry; use of variables in formulae; manipulation of formulae; write as a formula or equation a relationship given in words; substitute given values in order to find the value of the required unknown; solve problems involving numerical algebraic expressions |

| COMMUNICATIONS | | |
|---|---|---|
| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
| Reading<br>Writing<br>Viewing | Interprets source material<br>Preparing output data<br>Preparing output data | Comprehension, Speed/rate, Terminology<br>Spelling, Classification<br>Recognition of symbols, codes, emblems |

(TASK STATEMENT) CALCULATE PAYROLL

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY -- HAZARD |
|---|---|---|
| Pencils, Pens, Paper<br>Time cards, Time sheets<br>Job tickets<br>Payroll checks<br>Blank cards<br>Card layout forms<br>Printer layout forms<br>Earnings statements<br>Keypunch, Verifier, Calculator<br>Adding machine, Typewriter<br>Magnetic tape | Distribute time cards, time sheets, job tickets and W-2 forms<br>Collect time cards, time sheets, job tickets, W-2 forms<br>Keypunch payroll data<br>Prepare payroll programs<br>Verify payroll data | Hazards: Paper cuts<br>Improper lighting<br>Electrical shocks |
| **DECISIONS** | **CUES** | **ERRORS** |
| Determine ineffective programs | Incorrect data, ie., over payment or payroll | Calculation mistakes on time sheets and paychecks |

5b

(TASK STATEMENT) CALCULATE PAYROLL

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br>Professionalism:<br>Maintain capacity to foster cooperation and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br>Exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of physical expressions basic to peak physical performance: body rhythm, breathing coordinated with body movement; body balance and posture, movement from tension to relaxation and vice versa<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation, Relates to: comfort, caution, safety, and physical, emotional, and intellectual health<br>Conscious awareness of qualities basic to optimal mental performance: attention, observation, concentration, mental alertness, mental quietude, mental clarity, organization | Positive rationals<br>Hindu-Arabic numeral system<br>number/numeral, place value/expanded notation<br>Use of numbers (without calculation)<br>counting, ordering, indexing, ratio<br>Addition, subtraction, multiplication, division algorithms, order of operations<br>Reduction of fractions, changing mixed numbers to improper fractions, changing % to fractions & vice versa; finding a % of a number and what % one number is of another; changing fractions to decimal and vice versa; rounding off decimals and whole numbers, guess and check method; property of comparison, multiplication by zero<br>Use of computing devices and mechanical aids<br>calculators – electric and mechanical, computers<br>''Measure sense''/role of ''units'' ; rate<br>Measurement: non-geometric - time, money, temperature, weight, liquid<br>Conversion from standard unit to another; read and interpret tables, charts and graphs; use of variables in formulae and equations; manipulation of formulae; write as a formula or equation a relationship given in words; substitute given values in order to find the value of the required unknown; solve problems involving numerical algebraic expressions |

COMMUNICATIONS

| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
|---|---|---|
| Reading<br>Writing<br>Viewing | Interpreting basic data<br>Code programs<br>Code programs | Comprehension, Speed/rate, Terminology<br>Spelling, Informational reports, Logic<br>Usage, Recognition of symbols, codes, emblems |

(TASK STATEMENT) PROCESS INVENTORY CONTROL

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Pencils, Pens, Paper<br>Blank cards<br>Card layout forms<br>Printer layout forms<br>Inventory forms<br>Keypunch<br>Verifier<br>Typewriter<br>Telephone | Layout of card fields for keypunch operator<br>Transfer source information from business forms to inventory cards [bill of lading to 80 cal card]<br>Distributes inventory cards to stock room and data center<br>Alerts purchasing department to reorder specific stock | Hazards: Paper cuts<br>Improper lighting<br>Electrical shock |
| **DECISIONS** | **CUES** | **ERRORS** |
| Determine speed and accuracy for inventory control | Delayed sending inventory cards to proper channels | Inventory control fails |

(TASK STATEMENT) PROCESS INVENTORY CONTROL

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br>Professionalism<br>Maintain capacity to foster cooperation, and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br>Exhibit qualities of self-confidence, self-control, self-reliance, self-respect and adaptability<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of physical expressions basic to peak physical performance: body rhythm, breathing coordinated with body movement; body balance and posture; movement from tension to relaxation and vice versa<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation. Relates to: comfort, caution, safety, and physical, emotional, and intellectual health<br>Conscious awareness of qualities basic to optimal mental performance: attention, observation, concentration, mental alertness, mental quietude, mental clarity, organization | Positive rationals<br>Hindu-Arabic numeral system<br>number/numeral, place value/expanded notation<br>Use of numbers (without calculation)<br>counting, indexing, ratio<br>Addition, subtraction, multiplication, division algorithms<br>Order of operations<br>Reduction of fractions, changing mixed numbers to improper fractions, changing % to fractions and vice versa; finding a % of a number and what % a number is of another; changing fractions to decimal and vice versa; rounding off decimals and whole numbers; guess and check method; property of comparison; multiplication by zero<br>Use of computing devices and mechanical aids: calculators – electric and mechanical; computers<br>NOTE: Type of product sold by company: ''Measure sense''/ role of ''unit''; instruments; rate; measurement: geometric – linear, area, volume; measurement: non-geometric-time, money, temperature, weight, liquid, dry<br>Use of variables in formulae; manipulation of formulae; write as a formula or equation a relationship given in words; substitute given value in order to find the value of the required unknown; solve problems involving numerical algebraic expressions |

| COMMUNICATIONS | | |
|---|---|---|
| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
| Reading<br>Writing<br>Viewing | Interpret source material<br>Preparing input data<br>Preparing input data | Comprehension, Speed/rate, Terminology<br>Spelling, Classification<br>Recognition of symbols, codes, emblems |

(TASK STATEMENT) PREPARE FINANCIAL STATEMENTS

| TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON | PERFORMANCE KNOWLEDGE | SAFETY – HAZARD |
|---|---|---|
| Pencils, pens, paper<br><br>Blank cards<br><br>Magnetic tape disk | Select proper input data for specific financial statement, i.e., balance sheet, P. & L. statement, etc.<br><br>Select proper program for particular report<br><br>Initiate correct process to produce statement | Hazards: Improper lighting<br>Paper cut<br><br>Electrical shocks from electrical equipment used |

| DECISIONS | CUES | ERRORS |
|---|---|---|
| Determine speed and accuracy for output of financial statements | Incorrect input data, program, and procedures | Incomplete, inaccurate or aborted report |

(TASK STATEMENT) PREPARE FINANCIAL STATEMENTS

| SCIENCE | MATH – NUMBER SYSTEMS |
|---|---|
| BEHAVIORAL SCIENCE:<br>Professionalism:<br>Maintain capacity to foster cooperation, and to function efficiently when encountering fast changing, multiple, personal or situational varibles<br>Exhibit qualities of self-confidence, self-control, self-reliance, self-respect, and adaptability<br><br>Attributes of maximum functioning capacity<br>Conscious awareness of physical expressions basic to peak physical performance: body rhythm, breathing coordinated with body movement; body balance and posture; movement from tension to relaxation and vice versa<br>Conscious awareness of the need for a balance (both physical and mental) between tension and relaxation. Relates to: comfort, caution, safety, and physical, emotional, and intellectual health<br>Conscious awareness of qualities basic to optimal mental performance: attention, observation, concentration, mental alertness, mental quietude, mental clarity, organization | Positive rationals<br>Hindu-Arabic numeral system<br>number/numeral, place value/expanded notation<br>Use of numbers (without calculation)<br>counting, ordering, indexing, ratio<br>Addition, subtraction, multiplication, division algorithms<br>Order of operations<br>Reduction of fractions; changing mixed numbers to improper fractions; changing % to fractions and vice versa; finding a % of a number and what % one number is of another; changing fractions to decimal and vice versa; rounding off decimals and whole numbers; guess and check method; property of comparison; multiplication by zero<br>Use of computing devices and mechanical aids<br>calculators - electric and mechanical, computers<br>NOTE: Type of products sold by company: Measurement: geometric-linear, area, volume; measurement: non-geometric-time, money, temperature, weight, liquid, dry; conversion from one standard unit to another<br>Use of variables in formulae; manipulation of formulae; write as a formula or equation a relationship given in words; substitute given values in order to find the value of the required unknown; solve problems involving numerical algebraic expressions |

| COMMUNICATIONS | | |
|---|---|---|
| PERFORMANCE MODES | EXAMPLES | SKILLS/CONCEPTS |
| Speaking<br><br>Reading<br>Viewing | Obtaining correct input data from accounting department<br>Identifying correct input data<br>Auditing correct output data | Terminology, Enunciation, Clarity of expression, Classification<br>Comprehension, Terminology<br>Visual analysis, Memory, Logic, Recognition of symbols |